

IN THE CLAIMS:

1. (Currently Amended) An optical fiber having a grating and comprising:
a core of silica glass free of germanium and containing 100 to 1000 ppm fluorine
and 4 to 7 ppm OH groups ~~and a cladding surrounding the outer periphery of said core,~~
and wherein said grating is written in said core by irradiating said core with two
coherent femtosecond laser or picosecond laser beams which are coincident with
interference on said optical fiber,

a cladding surrounding the outer periphery of said core; and
a protective coating layer surrounding the outer periphery of said cladding
wherein said core is irradiated with the laser beams through said protective coating
layer.

2. (Cancelled).

3. (Previously Presented) The optical fiber as claimed in claim 1 wherein said
cladding is made from a silica glass containing 1000 to 7000 ppm of fluorine, or a silica
glass containing 2000 to 10000 ppm of boron.

4. (Currently Amended) The optical fiber ~~Fiber gratings~~ as claimed in claim 1
~~wherein which is characterized in that~~ said cladding is made from an ultraviolet-
transmitting resin.

5. (Previously Presented) The optical fiber as claimed in claim 1 wherein said
cladding comprises plural hollow holes extending in parallel with the optical axis.

6. (Cancelled).

7. (Currently Amended) A method for fabricating an optical fiber with a grating, said method comprising directing two coherent femtosecond laser or picosecond laser beams to be coincident, with interference, ~~onto~~on an optical fiber comprising a core made from silica glass free of germanium and containing 100 to 1000 ppm fluorine and 4 to 7 ppm OH groups, and a cladding surrounding the outer periphery of said core, and a protective coating layer surrounding the outer periphery of said cladding, thereby writing the grating into said core, with the laser beams passing through the cladding and protective coating.

8. (Previously Presented) A method for fabricating an optical fiber with a grating as claimed in claim 7, further comprising forming a flat area on the outer surface of said cladding, and wherein said laser beams are coincident on said flat area.

9. (Cancelled).

10. (Currently Amended) The optical fiber as claimed in claim 1 wherein said grating has a period of refractive index of about ~~100nm-100mm~~ to 1 μ m.

11. (Previously Presented) The optical fiber as claimed in claim 5 wherein said holes constitute 10-60% of the cross-sectional area of the optical fiber.

12. (Previously Presented) A method for fabricating an optical fiber as claimed in claim 7 further comprising treating said core and cladding with hydrogen.

13. (Previously Presented) A method for fabricating an optical fiber as claimed in claim 7 further comprising changing the period of gratings by changing the angle of interference of the two laser beams.